

WE CLAIM

1. Method for defining a compression scheme of a media stream, the method comprising the steps of:

determining a plurality of compression levels for the media stream and a relationship between valid values of compressed representations of the media stream, each compressed representation of the media stream associated with one of the compression levels;

defining the highest level of compression of the compression levels as a base level; and

defining enhancement data for representing a relationship between valid values of the compressed representations of the media stream.

2. The method according to claim 1 wherein the enhancement data reflects a relationship between valid values of two successive compressed representations of the media stream.

3. The method according to claim 1 wherein the step of defining enhancement data comprises defining enhancement data if a valid value of a compressed representation of a media stream is associated with at least two valid values of a successive compressed representation of the media stream.

4. The method according to claim 1 wherein the media stream is defined as an original media stream; and

wherein a relationship between valid values of distinct compressed representations of the media stream reflect a relationship between valid values of the original media stream mapped to the valid values of distinct compressed representations of the media stream.

5. The method according to claim 1 wherein the step of defining enhancement data relating to valid values of a pair of compressed

representations of the media stream comprises checking a relationship between valid values of lower compressed representations of the media stream, lower compressed representations of the media stream being characterized by a higher compression level.

6. The method according to claim 1 wherein the step of defining enhancement data comprises defining a p'th layer enhancement data for valid values of pair of a (p-1)' th and a p'th compressed representations of the media stream, if the reconstruction of the valid values of the p'th compressed representation of the media stream requires the p'th layer enhancement data, whereas p ranges between 2 and k, k reflects the number of compression levels.

7. The method according to claim 6 wherein the media stream is defined as an original media stream; and

wherein the p'th layer enhancement data is responsive to valid values of the original media stream being associated with valid values of both the p'th and the (p-1)'th compressed representation of the media stream.

8. The method according to claim 6 wherein the p'th layer enhancement data is responsive to previous layer enhancement data and to valid values of the media stream being associated with valid values of both the p'th and the (p-1)'th compressed representation of the media stream.

9. The method according to claim 6 wherein each p'th layer enhancement data includes at least one p'th layer enhancement data symbol; and wherein a p'th layer enhancement data symbol reflects a relationship between valid values of a (p-1)'th and a p'th compressed representation of the media stream.

10. The method according to claim 9 comprising defining a p'th layer enhancement data symbol, in response to an amount of valid values of

the p'th compressed representation of the media stream associated with the valid value of the (p-1)'th compression function.

11. The method according to claim 9 comprising defining a p'th layer enhancement data symbol, in response to previous layer enhancement data symbols and to an amount of valid values of the p'th compressed representation of the media stream associated with the valid value of the (p-1)'th compression function.
12. The method according to claim 9 comprising defining a p'th layer enhancement data symbol in response to valid values of the original media stream being associated with both the valid values of the (p-1)'th and the p'th compressed representation of the media stream.
13. The method according to claim 9 comprising defining a p'th layer enhancement data symbol in response previous layers enhancement data symbols and to valid values of the original media stream being associated with both valid values of the (p-1)'th and p'th compressed representation of the media stream.
14. The method according to claim 1 wherein the compressed representations of the media streams are generated by applying a compression function selected from the group consisting of:
  - sampling functions;
  - quantizing functions;
  - linear quantizing functions;
  - non-linear quantizing functions; and
  - uniform quantizing functions.
15. The method according to claim 1 further comprising a step of compressing the enhancement data.

16. The method according to claim 1 wherein enhancement data includes enhancement data symbols; and wherein the method further

comprising a step of variable length encoding the enhancement data symbols to provide enhancement data code words.

17. The method according to claim 1, wherein said media stream comprises one of the list consisting of:

- MPEG compliant media stream;
- original media stream;
- JPEG media stream;
- video stream;
- audio stream;
- data stream;
- H.261 compliant media stream;
- H.263 compliant stream;
- streaming media stream;
- JPEG stream;
- AC-3 audio stream;
- AAC audio stream; and
- a stream containing a plurality of streams.

18. The method according to claim 1 further comprising a step of:

- compressing the media stream according to the compression levels, thereby producing a plurality of compressed representations of the media stream;

- defining a selected one of said compressed representations of the media stream a base media layer, the selected compressed version being compressed according to the base level;

- determining if enhancement data is required for reconstructing a compressed representation of the media stream; and

- generating enhancement data, in response to the determination.

19. The method according to claim 18 wherein the generated enhancement data reflects a relationship between symbols of two successive compressed representations of the media stream.

20. The method according to claim 18 wherein generating enhancement data if a symbol of a compressed representation of a media stream is associated with at least two symbols of a successive compressed representation of the media stream.

21. The method according to claim 18 wherein the media stream is defined as an original media stream; and

wherein a relationship between symbols of distinct compressed representations of the media stream reflect a relationship between original media stream symbols mapped to the symbols of the distinct compressed representations of the media stream.

22. The method according to claim 20 wherein the step of determining a necessity of enhancement data relating to symbols of a pair of compressed representations of the media stream comprises checking a relationship between symbols of lower compressed representations of the media stream, lower compressed representations of the media stream being characterized by a higher compression level.

23. The method according to claim 20 wherein the step of determining a necessity of enhancement data comprises defining a p'th layer enhancement data for symbols of pair of a (p-1)' th and a p'th compressed representations of the media stream, if the reconstruction of the symbols of the p'th compressed representation of the media stream requires the p'th layer enhancement data, whereas p ranges between 2 and k, k reflects the number of compression levels.

24. The method according to claim 23 wherein the media stream is defined as an original media stream; and

wherein generating a p'th layer enhancement data in response to symbols of the original media stream being associated with symbols of both the p'th and the (p-1)'th compressed representation of the media stream.

25. The method according to claim 23 wherein generating a p'th layer enhancement data in response to previous layer enhancement data and to symbols of the media stream being associated with symbols of both the p'th and the (p-1)'th compressed representation of the media stream.

26. The method according to claim 23 wherein each p'th layer enhancement data includes at least one p'th layer enhancement data symbol; and wherein a p'th layer enhancement data symbol reflects a relationship between symbols of a (p-1)'th and a p'th compressed representation of the media stream.

27. The method according to claim 26 comprising generating a p'th layer enhancement data symbol in response to an amount of symbols of the p'th compressed representation of the media stream associated with the symbol of the (p-1)'th compression function.

28. The method according to claim 26 comprising generating a p'th layer enhancement data symbol in response to previous layer enhancement data symbols and to an amount of symbols of the p'th compressed representation of the media stream associated with the symbol of the (p-1)'th compression function.

29. The method according to claim 26 comprising generating a p'th layer enhancement data symbol in response to symbols of the original media stream being associated with both the symbols of the (p-1)'th and the p'th compressed representation of the media stream.

30. The method according to claim 26 wherein generating a p'th layer enhancement data symbol in response previous layers enhancement data symbols and to symbols of the original media stream being associated with symbols of both the (p-1)'th and p'th compressed representation of the media stream.

31. The method according to claim 18 wherein the compressed representations of the media streams are generated by applying a compression function selected from the group consisting of:

- sampling functions;
- quantizing functions;
- linear quantizing functions;
- non-linear quantizing functions; and
- uniform quantizing functions.

32. The method according to claim 18 further comprising a step of compressing the enhancement data.

33. The method according to claim 18 wherein enhancement data includes enhancement data symbols; and wherein the method further comprising a step of variable length encoding the enhancement data symbols to provide enhancement data code words.

34. The method according to claim 18, wherein said media stream comprises one of the list consisting of:

- MPEG compliant media stream;
- original media stream;
- JPEG media stream;
- video stream;
- audio stream;
- data stream;
- H.261 compliant media stream;
- H.263 compliant stream;
- streaming media stream;
- JPEG stream;
- AC-3 audio stream;
- AAC audio stream; and
- a stream containing a plurality of streams.

35. The method of claim 18 further comprising a step of encrypting the base media layer, whereas the base media layer and the enhancement data define an encrypted representation of the media stream.

36. A method for generating a compressed representation of a media stream, the media stream comprising a plurality of media stream symbols, the method comprising the steps of:

determining a plurality of compression functions of statistically distinct compression levels, wherein applying a compression function on the media stream produces a compressed representation of the media stream; determining a relationship between valid values of compressed representations of the media stream;

defining the statistically most compressed representation of the media stream as a base layer media stream;

defining enhancement data for representing a relationship between valid values of the compressed representations of the media stream;

compressing the media stream by applying the compression functions, thereby producing a plurality of compressed representations of the media stream;

determining if enhancement data is required for reconstructing a compressed representation of the media stream; and

generating enhancement data, in response to the determination.

37. The method according to claim 36 wherein the p'th compressed representation is characterized by a p'th statistically compression level, p ranges between 1 to k, k reflecting the amount of compression functions; and wherein the p'th compressed representation of the media stream is defined as a p'th layer media stream.

38. The method according to claim 36 wherein the step of determining starts from the second media layer and ends at the original media stream, the original media stream is defined as the media stream.

39. The method according to claim 36 wherein determining a necessity of enhancement data relating to symbols of a pair of compressed representations of the media stream comprises checking a relationship between symbols of lower compressed representations of the media stream, lower compressed representations of the media stream being characterized by a higher compression level.

40. The method according to claim 36 wherein each compressed representation of the media stream comprising a plurality of symbols; the symbols of a p'th compressed representation of the media stream defined as a p'th media layer symbol;

wherein for each symbol of the original media layer and for each value of p between 2 and k executing the steps of:

converting the original media layer symbol to a (p-1)'th media layer symbol and to a p'th media layer symbol; whereas the base media layer symbol defined as the first media layer symbol;

determining whether a generation of a p'th layer enhancement data symbol is required for reconstructing the p'th media layer symbol; and

generating a p'th layer enhancement data symbol, in response to the determination.

41. The method according to claim 40 wherein generating a p'th layer enhancement data in response to previous layer enhancement data and to symbols of the media stream being associated with symbols of both the p'th and the (p-1)'th compressed representation of the media stream.

42. The method according to claim 40 wherein for each p that exceeds one, the determination is responsive to an amount of p'th media layer symbols associated with the (p-1)'th media layer symbol.

43. The method according to claim 40 wherein for each p that exceeds one, the determination is responsive to symbols of the media

stream associated with the p'th media layer symbol and with the (p-1)'th media layer symbol.

44. The method according to claim 40 wherein for each p that exceeds 2, the determination is based upon (p-m)'th media layer symbols that were generated from the base media layer symbol,  $1 < m < p$ .

45. The method according to claim 40 wherein for each p that exceeds one, the determination is responsive to an updated (p-1)'th layer symbol set, the updated (p-1)'th symbol set comprising of original media layer symbols associated with the (p-1)'th and previous media layer symbols.

46. The method according to claim 40 wherein for each p that exceeds one, the determination is responsive to an original p'th layer symbol sets associated with at least one relevant p'th media layer symbol, a relevant p'th media layer symbol being mapped to the (p-1)'th media layer symbol, the original p'th symbol set comprising of original media layer symbols associated with the p'th media layer symbol.

47. The method according to claim 40 wherein generating enhancement data in response to an updated (p-1)'th layer symbol set and a p'th media layer symbol set; the updated (p-1)'th media layer set includes original media layer symbols associated with previous media layer symbols.

48. The method according to claim 40 wherein the relationship between p'th and (p-1)'th media layer symbols reflects a relationship between original media layer symbols that are mapped to the p'th and the (p-1)'th media layer symbols.

49. The method according to claim 40 wherein for  $p=k$  the determination is responsive to the amount of k'th media layer symbols that are included within an updated (k-1)'th layer symbol set; wherein the

k'th media layer is the original media layer, the updated (k-1)'th layer symbol set comprising original media layer symbols associated with the (k-1)'th and previous media layer symbols.

50. The method according to claim 40 wherein a p'th enhancement data layer includes at least one p'th layer enhancement data symbol; and

wherein, generating a p'th layer enhancement data symbol, in response to previous layer enhancement data symbols and to an amount of symbols of the p'th compressed representation of the media stream associated with the symbol of the (p-1)'th compression function.

51. The method according to claim 20 wherein a p'th enhancement data layer includes at least one p'th layer enhancement data symbol; and

wherein generating a p'th layer enhancement data symbol in response to previous layers enhancement data symbols and to symbols of the original media stream being associated with symbols of both the (p-1)'th and p'th compressed representation of the media stream.

52. The method according to claim 40 further comprising a step of defining an original (p-1)'th layer symbol set for each (p-1)'th media layer symbol, the original (p-1)'th media layer set comprising of original media layer symbols associated with p'th media layer symbol that are associated with the (p-1)'th media layer symbols.

53. The method according to claim 52 further comprising the steps of:

finding the associated p'th media layer symbols associated with each original media layer symbol of the original (p-1)'th layer symbol set; and

defining a union of all the associated p'th media layer symbols as a p'th media layer set.

54. The method according to claim 53 further comprising the steps of:

dividing the original (p-1)'th layer symbol set to subsets, each subset corresponding to a single symbol out of the p'th media layer set; and

generating a p'th layer enhancement data symbol, in view of an original p'th layer symbol subset associated with a true p'th media layer symbol.

55. The method according to claim 54 further comprising a step of replacing an original p'th layer symbol set with the original p'th layer symbol subset associated with a true p'th media layer symbol.

56. The method according to claim 36 further comprising a step of compressing the enhancement data.

57. The method according to claim 36 wherein enhancement data includes enhancement data symbols; and wherein the method further comprising a step of variable length encoding the enhancement data symbols to provide enhancement data code words.

58. The method according to claim 57 wherein defining an enhancement data code word reflecting a relationship between a (p-1)'th media layer symbol and a p'th media layer symbol in response to the complexity of reconstructing an original media layer symbol from the p'th media layer symbol.

59. The method according to claim 36, wherein said media stream comprises one of the list consisting of:

MPEG compliant media stream;

original media stream;

JPEG media stream;

video stream;

audio stream;

data stream;

H.261 compliant media stream;

H.263 compliant stream;  
streaming media stream;  
JPEG stream;  
AC-3 audio stream;  
AAC audio stream; and  
a stream containing a plurality of streams.

60. The method of claim 36 further comprising a step of encrypting the base media layer, whereas the base media layer and the enhancement data defining an encrypted representation of the media stream.

61. A method for transmitting a transmitted representation of a media stream over a bandwidth limited medium, the method comprising the steps of:

determining a plurality of compression functions of statistically distinct compression levels, wherein applying a compression function on the media stream produces a compressed representation of the media stream; determining a relationship between valid values of compressed representations of the media stream;

defining the statistically most compressed representation of the media stream as a base layer media stream;

defining enhancement data for representing a relationship between valid values of the compressed representations of the media stream;

compressing the media stream by applying the compression functions, thereby producing a plurality of compressed representations of the media stream;

determining if enhancement data is required for reconstructing a compressed representation of the media stream;

generating an enhancement data layer, in response to the determination;

determining an available bandwidth of the bandwidth limited medium;

generating a transmitted representation of the media stream, the transmitted representation of the media stream comprises the base media layer, wherein the bandwidth of the base media layer does not exceed the available bandwidth of the bandwidth limited medium; and

providing the transmitted representation of the media stream to the bandwidth limited medium.

62. A method for transmitting a transmitted representation of a media stream over a bandwidth limited medium, the method comprising the steps of:

determining a plurality of compression functions of statistically distinct compression levels, wherein applying a compression function on the media stream produces a compressed representation of the media stream; determining a relationship between valid values of compressed representations of the media stream;

defining the statistically most compressed representation of the media stream as a base layer media stream;

defining enhancement data for representing a relationship between valid values of the compressed representations of the media stream;

compressing the media stream by applying the compression functions, thereby producing a plurality of compressed representations of the media stream;

determining if enhancement data is required for reconstructing a compressed representation of the media stream;

generating an enhancement data layer, in response to the determination;

determining an available bandwidth of the bandwidth limited medium;

generating a transmitted representation of the media stream, the transmitted representation of the media stream comprises the base media layer and at least one successive enhancement data layer, wherein the aggregate bandwidth of the base media layer and the at

least one successive enhancement data layer does not exceed the available bandwidth of the bandwidth limited medium; and

providing the transmitted representation of the media stream to the bandwidth limited medium.

63. The method according to claim 62 wherein the p'th compressed representation is characterized by a p'th statistically compression level, p ranges between 1 to k, k reflecting the amount of compression functions; and wherein the p'th compressed representation of the media stream is defined as a p'th layer media stream.

64. The method according to claim 62 wherein the step of determining starts from the second media layer and ends at the original media stream, the original media stream is defined as the media stream.

65. The method according to claim 62 wherein determining a necessity of enhancement data relating to symbols of a pair of compressed representations of the media stream comprises checking a relationship between symbols of lower compressed representations of the media stream, lower compressed representations of the media stream being characterized by a higher compression level.

66. The method according to claim 62 wherein each compressed representation of the media stream comprising a plurality of symbols; the symbols of a p'th compressed representation of the media stream are defined as a p'th media layer symbol;

wherein for each symbol of the original media layer and for each value of p between 2 and k executing the steps of:

converting the original media layer to a (p-1)'th media layer symbol and to a p'th media layer symbol; whereas the base media layer symbol defined as the 1'th media layer symbol;

determining whether a generation of a p'th layer enhancement data symbol is required for reconstructing the p'th media layer symbol; and

generating a p'th layer enhancement data symbol, in response to the determination.

67. The method according to claim 66 wherein generating a p'th layer enhancement data in response to previous layer enhancement data and to symbols of the media stream being associated with symbols of both the p'th and the (p-1)'th compressed representation of the media stream.

68. The method according to claim 66 wherein for each p that exceeds one, the determination is responsive to an amount of p'th media layer symbols associated with the (p-1)'th media layer symbol.

69. The method according to claim 68 wherein for each p that exceeds one, the determination is responsive to symbols of the media stream associated with the p'th media layer symbol and with the (p-1)'th media layer symbol.

70. The method according to claim 68 wherein for each p that exceeds 2, the determination is based upon (p-m)'th media layer symbols that were generated from the base media layer symbol,  $1 < m < p$ .

71. The method according to claim 68 wherein for each p that exceeds one, the determination is responsive to an updated (p-1)'th layer symbol set, the updated (p-1)'th symbol set comprising of original media layer symbols associated with the (p-1)'th and previous media layer symbols.

72. The method according to claim 68 wherein for each p that exceeds one, the determination is responsive to an original p'th layer symbol sets associated with at least one relevant p'th media layer symbol, a relevant p'th media layer symbol being mapped to the (p-1)'th media layer symbol, the original p'th symbol set comprising of original media layer symbols associated with the p'th media layer symbol.

73. The method according to claim 68 wherein generating enhancement data including generating enhancement data if a (p-1)'th media layer symbol is associated with at least two p'th media layer symbols.

74. The method according to claim 68 wherein the relationship between p'th and (p-1)'th media layer symbols reflects a relationship between original media layer symbols that are mapped to the p'th and the (p-1)'th media layer symbols.

75. The method according to claim 68 wherein for p=k the determination is responsive to the amount of k'th media layer symbols that are included within an updated (k-1)'th layer symbol set; wherein the k'th media layer is the original media layer, the updated (k-1)'th layer symbol set comprising original media layer symbols associated with the (k-1)'th and previous media layer symbols.

76. The method according to claim 68 wherein a p'th enhancement data layer includes at least one p'th layer enhancement data symbol; and

wherein, generating a p'th layer enhancement data symbol, in response to previous layer enhancement data symbols and to an amount of symbols of the p'th compressed representation of the media stream associated with the symbol of the (p-1)'th compression function.

77. The method according to claim 68 wherein a p'th enhancement data layer includes at least one p'th layer enhancement data symbol; and

wherein generating a p'th layer enhancement data symbol in response previous layers enhancement data symbols and to symbols of the original media stream being associated with symbols of both the (p-1)'th and p'th compressed representation of the media stream.

78. The method according to claim 68 further comprising a step of defining an original (p-1)'th layer symbol set for each (p-1)'th media layer symbol, the original (p-1)'th media layer set comprising of original media layer symbols associated with p'th media layer symbol that are associated with the (p-1)'th media layer symbols.

79. The method according to claim 78 further comprising the step of:  
finding the associated p'th media layer symbols associated with each original media layer symbol of the original (p-1)'th layer symbol set;  
and  
defining a union of all the associated p'th media layer symbols as a p'th media layer set.

80. The method according to claim 79 further comprising the steps of:  
dividing the original (p-1)'th layer symbol set to subsets, each subset corresponding to a single symbol out of the p'th media layer set;  
and  
generating a p'th layer enhancement data symbol, in view of an original p'th layer symbol subsets associated with a true p'th media layer symbol.

81. The method according to claim 80 further comprising a step of replacing an original p'th layer symbol set with the original p'th layer symbol subsets associated with a true p'th media layer symbol.

82. The method according to claim 62 further comprising a step of compressing the enhancement data.

83. The method according to claim 62 wherein enhancement data includes enhancement data symbols; and wherein the method further comprising a step of variable length encoding the enhancement data symbols to provide enhancement data code words.

84. The method according to claim 83 wherein defining an enhancement data code word reflecting a relationship between a (p-1)'th media layer symbol and a p'th media layer symbol in response to a complexity of reconstructing an original media layer symbol from the p'th media layer symbol.

85. The method according to claim 62, wherein said media stream comprises one of the list consisting of:

- MPEG compliant media stream;
- original media stream;
- JPEG media stream;
- video stream;
- audio stream;
- data stream;
- H.261 compliant media stream;
- H.263 compliant stream;
- streaming media stream;
- JPEG stream;
- AC-3 audio stream;
- AAC audio stream; and
- a stream containing a plurality of streams.

86. The method of claim 62 further comprising a step of encrypting the base media layer, whereas the base media layer and the enhancement data define an encrypted representation of the media stream.

87. The method of step 62 wherein the bandwidth limited medium comprises of at least two communication channels, and wherein transmitting distinct portions of the transmitted representation of the media stream over distinct communication channels.

88. The method according to claim 62 further comprising attaching descending priorities to lower compression level compressed representations of the original media stream.

89. The method according to claim 88 wherein transmitting portions of the transmitted representation of the media stream in response to the priorities.

90. The method of claim 88 wherein the bandwidth limited medium is configured to accommodate prioritized transmissions and wherein transmitting the base media layer and enhancement data layers in response to the associated priorities.

91. The method according to claim 62 wherein restricting a transmission of enhancement data layers destined to a client in view of a client profile.

92. The method according to claim 62 wherein the step of providing the transmitted representation of the media stream to the bandwidth limited medium is preceded by a step of packetizing the transmitted representation of the media stream to provide transmitted representation packets.

93. The method according to claim 92 further comprising associating a priority to each transmitted representation packet.

94. The method according to claim 93 wherein transmitting transmitted representation packets in response to the priorities.

95. A method for generating a reconstructed media stream, the method comprising the steps of:

determining a compression scheme and an enhancement data generation scheme utilized for generating a base media layer stream and enhancement data; enhancement data representing a relationship

between valid values of compressed representation of the original media stream;

receiving the base media layer and at least a portion of the enhancement data; and

producing the reconstructed media stream from the received base media layer stream and at least portion of the enhancement data in response to the compression scheme and enhancement data generation scheme.

96. The method according to claim 95 wherein a p'th compressed representation of the media stream is characterized by a p'th statistically compression level, p ranges between 1 to k, k reflecting the amount of compression functions; and wherein the p'th compressed representation of the media stream is defined as a p'th layer media stream.

97. The method according to claim 95 comprising a step of determining which compressed representations of the media streams to reconstruct, in response to the reception of at least the base media layer.

98. The method according to claim 97 wherein the determination is further responsive to a reconstruction entity profile.

99. The method according to claim 95 wherein the step of producing comprises determining a necessity of p'th layer reconstruction data for reconstructing a p'th compressed representation of the media stream, given the (p-1)'th compressed representation of the media stream.

100. The method according to claim 99 wherein a necessity determination relating to symbols of a pair of compressed representations of the media stream comprises checking a relationship between symbols of lower compressed representations of the media stream, lower compressed representations of the media stream being characterized by a higher compression level.

101. The method according to claim 95 wherein each compressed representation of the media stream comprising a plurality of symbols; the symbols of a p'th compressed representation of the media stream defined as a p'th media layer symbol;

wherein for each symbol of the base media layer and for each value of p between 2 and x executing the steps of:

converting a (p-1)'th media layer symbol to at least one p'th media layer symbol; whereas the base media layer symbol is defined as the first media layer symbol;

determining whether a p'th layer enhancement data symbol is required for reconstructing the p'th media layer symbol; and

providing a reconstructed p'th media layer symbol, in response to the determination; wherein x reflects a highest media layer symbol to be reconstructed from the base media layer symbol.

102. The method according to claim 101 wherein the determination is responsive to previous layer enhancement data and to symbols of the media stream being associated with symbols of both the p'th and the (p-1)'th compressed representation of the media stream.

103. The method according to claim 101 wherein for each p that exceeds one, the determination is responsive to an amount of p'th media layer symbols associated with the (p-1)'th media layer symbol.

104. The method according to claim 101 wherein for each p that exceeds one, the determination is responsive to symbols of the media stream associated with the p'th media layer symbol and with the (p-1)'th media layer symbol.

105. The method according to claim 101 wherein for each p that exceeds 2, the determination is based upon (p-m)'th media layer symbols that were reconstructed from the base media layer symbol,  $1 < m < p$ .

106. The method according to claim 101 wherein for each  $p$  that exceeds 2, the determination is responsive to an updated  $(p-1)$ 'th layer symbol set, the updated  $(p-1)$ 'th symbol set comprising of original media layer symbols associated with the  $(p-1)$ 'th and previous media layer symbols.

107. The method of claim 101 wherein a determination is responsive to a relationship between the updated  $(p-1)$ 'th layer symbol set to original  $p$ 'th layer symbol sets of  $p$ 'th media layer symbols that can be associated with the  $(p-1)$ 'th media layer set.

108. The method according to claim 107 wherein the determination is responsive to the content of the intersection of the updated  $(p-1)$ 'th layer symbol set and each of the original  $p$ 'th layer symbol sets.

109. The method according to claim 101 wherein a relationship between  $p$ 'th and  $(p-1)$ 'th media layer symbols reflects a relationship between original media layer symbols that are mapped to the  $p$ 'th and the  $(p-1)$ 'th media layer symbols.

110. The method according to claim 101 wherein a  $p$ 'th enhancement data layer includes at least one  $p$ 'th layer enhancement data symbol; and

wherein, determining a necessity of a  $p$ 'th layer enhancement data symbol in response to previous layer enhancement data symbols and to an amount of symbols of the  $p$ 'th compressed representation of the media stream associated with the symbol of the  $(p-1)$ 'th compression function.

111. The method according to claim 101 wherein a  $p$ 'th enhancement data layer includes at least one  $p$ 'th layer enhancement data symbol; and

wherein determining a necessity of a p'th layer enhancement data symbol in response to previous layers enhancement data symbols and to symbols of the original media stream being associated with symbols of both the (p-1)'th and p'th compressed representation of the media stream.

112. The method according to claim 101 wherein x reflects a reconstruction entity profile.

113. The method according to claim 101 further comprising a step of defining an original (p-1)'th layer symbol set for each (p-1)'th media layer symbol, the original (p-1)'th media layer set comprising of original media layer symbols associated with p'th media layer symbol that are associated with the (p-1)'th media layer symbols.

114. The method according to claim 113 further comprising a step of finding the associated p'th media layer symbols associated with each original media layer symbol of the original (p-1)'th layer symbol set.

115. The method according to claim 114 further comprising defining a union of all the associated p'th media layer symbols as a p'th media layer set.

116. The method according to claim 115 further comprising dividing the original (p-1)'th layer symbol set to subsets, each subset corresponding to a single symbol out of the p'th media layer set.

117. The method according to claim 116 further comprising a step of determining a necessity of a p'th layer enhancement data symbol, in view of an original p'th layer symbol subsets associated with a true p'th media layer symbol.

118. The method according to claim 117 further comprising a step of replacing an original p'th layer symbol set with the original p'th layer symbol subsets associated with a true p'th media layer symbol.

119. The method according to claim 95 wherein the enhancement data is compressed and wherein the method further comprising a step of decompressing the compressed enhancement data.

120. The method according to claim 95 wherein enhancement data includes variable length encoded enhancement data code words; and wherein the method further comprising a step of variable length decoding the variable length encoded enhancement data code words to provide enhancement data symbols.

121. The method according to claim 95 wherein the media base layer is encrypted and wherein the method further comprising the step of decrypting the encrypted base media layer.

122. The method according to claim 95 wherein the reconstruction of the media stream destined to a client is further constrained by the clients profile.

123. The method according to claim 95, wherein said media stream comprises one of the list consisting of:

- MPEG compliant media stream;
- original media stream;
- JPEG media stream;
- video stream;
- audio stream;
- data stream;
- H.261 compliant media stream;
- H.263 compliant stream;
- streaming media stream;
- JPEG stream;

AC-3 audio stream;  
AAC audio stream; and  
a stream containing a plurality of streams.

124. A method for providing scalable bandwidth transmission of a plurality of media streams, the method comprising the steps of: determining a group of compression levels for each said media streams; and defining the highest level of compression of said compression levels of each said media streams, as a base level thereof.

125. The method according to claim 124, further comprising the steps of: compressing each said media streams according to a respective one of said groups of said compression levels, thereby producing a group of compressed versions, for each said media streams; and defining a selected one of said compressed versions of a selected group of compressed versions, a base layer, said selected compressed version being compressed according to said base level, of said selected group of compression levels.

126. The method according to claim 125 further comprising the steps of:

determining if an enhancement data layer is required for reconstructing a compressed representation of a media layer in view of another compressed representation of the media stream;

producing an enhancement data layer in view of the determination, thereby defining a group of enhancement data layers.

127. The method according to claim 126, further comprising the step of associating between portions of different ones of said base layers.

128. The method according to claim 127, further comprising the steps of: associating between portions of different ones of said base layers; and associating between portions of different ones of said enhancement data layers of the same order, of different ones of said groups.

129. The method according to claim 128, further comprising the step of producing portions of transmitted representations of the media streams, each from a respective one of said portions of said associated base layers and from at least one of a respective one of said portions of said enhancement data layers.

130. The method according to claim 129, further comprising the step of transmitting said associated portions of said base layers and at least selected ones of said associated portions of said enhancement data layers, to a remote location.

131. The method according to claim 130, further comprising the step of packetizing said portions.

132. The method according to claim 131, further comprising the step of transmitting said packetized portions to a remote location.

133. A method for reconstructing portions of media streams from portions of a base layer streams and respective portions of at least one enhancement data layer streams, comprising the steps of:

detecting an association between each said base layer stream portions and at least a respective portion of at least one respective enhancement data layer streams;

determining if a reconstruction data layer portion is required for reconstructing a portion of a compressed representation of a media stream; and

reconstructing the portion of the compressed representation of the media stream in response to the determination.

134. A method for providing scalable bandwidth transmission of a plurality of media streams, via a communication channel, the method comprising the steps of:

determining a group of compression levels for each said media streams;

defining the highest level of compression of said compression levels of each said media streams, as a base level thereof, wherein the total sum of the compressed versions of said media streams according to the respective ones of said base levels, at any point in time, is less than an available bandwidth of the communication channel.

135. The method according to claim 134, further comprising the step of producing transmitted representations of the media streams, each from a respective one of said portions of said associated base layers and from at least one of a respective one of said portions of said enhancement data layers, wherein the total sum of bandwidths of each said transmitted enhancement data reconstructed media streams does not exceed an available bandwidth of the communication channel.

136. The method according to claim 135, further comprising the step of transmitting said associated portions of said base layers and at least selected ones of said associated portions of said enhancement data layers, to a remote location, wherein the total sum of bandwidths of said associated portions of said base layers and at least selected ones of said associated portions of said enhancement data layers does not exceed an available bandwidth of said communication channel.

137. The method according to claim 135, further comprising the step of packetizing said associated portions of said base layers and at least selected ones of said associated portions of said enhancement data layers.

138. The method according to claim 137, further comprising the step of transmitting said packets to a remote location wherein the total sum of bandwidths of the transmitted packets does not exceed the available bandwidth of the communication channel.

139. The method according to claim 134, wherein said media stream comprises one of the list consisting of:

MPEG compliant video stream;  
original media stream;  
JPEG media stream;  
video stream;  
audio stream;  
data stream;  
H.261 compliant media stream;  
H.263 compliant media stream;  
streaming media;  
JPEG stream;  
MPEG compliant audio stream;  
AC-3 audio stream;  
AAC audio stream; and  
a stream containing a plurality of streams.

140. A Scalable bandwidth transmission media stream generating apparatus comprising:

a media analyzer;  
a base layer and enhancement data layer generator, said media analyzer receiving a media stream and determining a compression scheme , said base layer and enhancement data layer generator processing said media stream according to said compression scheme, thereby producing a base layer and a plurality of enhancement data layers.

141. The scalable bandwidth transmission media stream generating apparatus according to claim 140, further comprising a storage unit, connected to said base layer and enhancement data layer generator, wherein said storage unit is divided to a plurality of queues, each said queues storing a selected one of said base layers and said enhancement data layers.

142. The scalable bandwidth transmission media stream generating apparatus according to claim 141, further comprising a switching controller, connected to said a storage unit, for retrieving selected successive ones of said base layers and said enhancement data layers.

143. The scalable bandwidth transmission media stream generating apparatus according to claim 142 further comprising a media layer reconstructing unit, connected to said switching controller, for producing a reconstructed media stream from said base layer and at least a successive one of said enhancement data layers, received from said routing unit.

144. Scalable bandwidth transmission media stream generating apparatus comprising:

a plurality of media analyzers; and

a plurality of base layer and enhancement data layer generators, each associated with and connected to a selected one of said media analyzers, each said media analyzers receiving a different media stream and determining a compression scheme , each said base layer and enhancement data layer generators processing said media stream according to said compression scheme, thereby producing a base layer and a plurality of enhancement data layers.

145. The scalable bandwidth transmission media stream generating apparatus according to claim 144, further comprising a storage unit, connected to said base layer and enhancement data layer generators, wherein said storage unit is divided to a plurality of queues, each said queues storing a selected one of said base layers and said enhancement data layers.

146. The scalable bandwidth transmission media stream generating apparatus according to claim 145, further comprising a switching controller, connected to said a storage unit, for retrieving selected successive ones of said base layers and said enhancement data layers.

147. The scalable bandwidth transmission media stream generating apparatus according to claim 146, further comprising a media layer reconstruction unit, connected to said switching controller, for producing a reconstructed media streams from said base layers and at least a successive ones of said enhancement data layers, received from said routing unit.

148. The method according to claim 16 wherein defining an enhancement data code word reflecting a relationship between a (p-1)'th media layer symbol and a p'th media layer symbol in response to a complexity of reconstructing an original media layer symbol from the p'th media layer symbol.

149. The method according to claim 33 wherein defining an enhancement data code word reflecting a relationship between a (p-1)'th media layer symbol and a p'th media layer symbol in response to a complexity of reconstructing an original media layer symbol from the p'th media layer symbol.

150. The method according to any claim of claims 16, 33, 57 and 83 wherein defining an enhancement data code word reflecting a relationship between a (p-1)'th media layer symbol and a p'th media layer symbol in response to an amount of p'th media layer symbols associated with the (p-1)'th media layer symbols.

151. The method according to any claim of claims 16, 33, 57 and 83 wherein defining an enhancement data code word reflecting a relationship between a (p-1)'th media layer symbol and a p'th media layer symbol in response to an amount of original media layer symbols associated with each of the p'th media layer symbols associated with the (p-1)'th media layer symbol.

152. The method according to any claim of claims 16, 33, 57 and 83 wherein defining an enhancement data code word reflecting a relationship between a (p-1)'th media layer symbol and a p'th media layer symbol in response to a statistical frequency of the p'th media layer symbol.

153. The method according to any claim of claims 16, 33, 57 and 83 wherein defining an enhancement data code word reflecting a relationship between a (p-1)'th media layer symbol and a p'th media layer symbol in response to a statistical probability of the (p-1)'th media layer symbol.

154. The method according to any claim of claims 16, 33, 57 and 83 wherein defining an enhancement data code word reflecting a relationship between a (p-1)'th media layer symbol and a p'th media layer symbol in response to an amount of yet additional enhancement data symbols required to reconstruct an original media layer symbol out of the (p-1)'th media layer symbol.

155. The method according to claim 18 further comprising a step of embedding a watermark in at least one of the base media layer and an enhancement data layer.